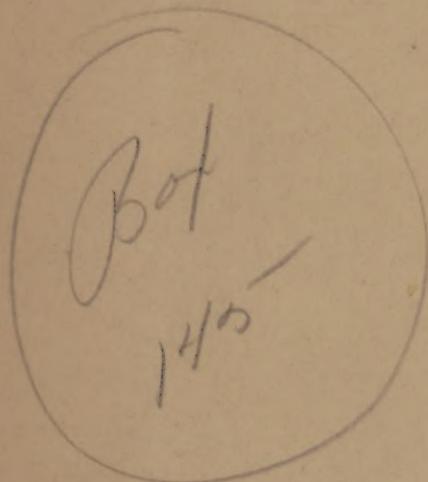


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Compliment of  
Charles W. Dulles





## TATTOOING AS A MEANS OF COMMUNICATING SYPHILIS;

AN INVESTIGATION OF

TWENTY-TWO CASES EXPOSED TO INOCULATION WITH THE VIRUS OF  
MUCOUS PATCHES, IN FIFTEEN OF WHICH SYPHILIS FOLLOWED.

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In the beginning of September, 1877, a man presented himself in Dr. Maury's wards in the Philadelphia Hospital, having upon his arm a sore which had the characteristics of a chancre, and suffering from other evidences of constitutional syphilis. The chancre was situated upon a tattooed figure, which had been placed there about two and a half months before, by a "professional" tattooer who moistened his pigments in whole or in part by inserting in his mouth the needles he used. So interesting a matter at once engaged earnest attention, and led to the investigation, first, of this one case, and afterwards of others in this city and in Reading, where such extensive tattooing had been done that the physicians in the town had had their attention attracted to its evil results, and were glad to co-operate with us in determining their nature and extent.<sup>1</sup>

With regard to the latter point, however, we have not been able to arrive at any, even approximate, conclusion. The number infected must be much larger than that which we have been able to reach. For six months has this tattooer had lesions, which are hereafter described, and during all that time been doing his work whenever he had an opportunity, in Philadelphia, Reading, Jersey City, and New York; and the majority of those tattooed must have received the seeds of his disease.

<sup>1</sup> At this point we wish to acknowledge with thanks our obligation to Doctors Marshall, Kalbach, Kuhn, Reeser, Ammon, Luther, and Weidman, of Reading, for facilitating our investigations in the latter city; and to Doctors Kerr and Anderson, internes at the Philadelphia Hospital, for assistance in different ways.

From the time our investigations began, the securing and examining the person of the tattooer was considered of the utmost importance, both in the interests of science and for the safety of the community. Consequently the police in different parts of the country were notified and search instituted for him. On the 13th of October he was arrested, with all his implements, in Philadelphia, and sent to the Philadelphia Hospital. He was there fully identified by a number of his victims; and later in the day was, at the suggestion of Dr. Maury, committed to the House of Correction, where he is at present.

The following is his history, as given by himself and carefully compared with the records of the Philadelphia Hospital and the statements of those whom he tattooed.

James Kelly, aet. 26, born in Bucks Co., Penna., by trade a painter, but actually a vagrant; was examined October 13th, and again, through the courtesy of Drs. Hendrie and Pennybaker, at the House of Correction October 25th.

A man of extremely bad habits, a very hard drinker, a constant chewer of tobacco, and of filthy personal appearance. He never had syphilis until early in February, 1877, when he contracted four or five chancres, followed by an inguinal bubo. Under self-treatment, he did so badly he was compelled, Feb. 17th, to betake himself to the Philadelphia Hospital, where he was treated locally by cauterization of the chancres with nitric acid, and the application of lotio nigra and iodoform. On March 6th he left the hospital and went to Reading, where he remained about a month, tattooing as occasion offered, then for a short time to Jersey City, and returned, April 14th, to the hospital to be treated for mucous patches in his mouth and condylomata about his anus. He remained here until May 16th, when he left uncured, and going to Reading continued his tattooing. From this time onward he seems to have communicated his disease to most of the subjects of his art.<sup>1</sup> Remaining in Reading nearly a month, he then went for a few days to Jersey City, and on June 20th turned up for the third time in the Philadelphia Hospital, with mucous patches and condylomata still flourishing. On August 2d he was discharged for insubordination, and went to Jersey City. About this time he had iritis. He remained in Jersey City until October 6th, when he returned to Philadelphia, where he was one week later arrested and committed to the House of Correction.

At the time of our examination he has slight inguinal adenitis, mucous patches in his mouth, and a condylomatous patch at the bottom of his scrotum. The mucous patches in his mouth are extensive. Two are situated back of the angles and just within the lips. These are the only present manifestation of syphilis.

The following was his customary method of tattooing: A figure having been selected from a book of plates which he carried with him, he would rub up India ink with water and pick the outlines in with a few needles set in a holder. Then putting the needles in his mouth and sucking out the residue of pigment, he would thrust them thus moistened into a bottle of powdered vermillion and insert what adhered. To renew the vermillion

<sup>1</sup> It will be noticed that all the cases here reported were tattooed at or after this time, viz: while he had mucous patches in his mouth.

the needles were repeatedly wetted in his mouth. In some cases both pigments were moistened with saliva, and in others he spit upon the finished tattoo and rubbed it well with his hand or a dirty cloth he had. The figures he made were often very handsome, and always skilfully done. Indeed, this was his only means of livelihood, bringing him in fees ranging from a drink of whiskey to two dollars, according to the extent and elaborateness of his work.

Such, then, being the history of the tattooer and his method of operating, we will proceed to the consideration of its results as exhibited in the following twenty-two cases, which are not all that we have examined, but such as we think of sufficient scientific interest, as well as of sufficient accuracy to report.

It may not be amiss to state here that, to attain as much thoroughness as possible, a definite plan of examination was first prepared and each investigation conducted according to it; that every patient was examined by us personally and scrutinized from head to foot; that the asking of leading questions was avoided, especially in regard to the primary lesions, and that special inquiry was made to exclude the possibility of the syphilis, where it occurred, having been acquired in some other way than by the tattooing. Some apparent omissions in the accounts are attributable to the difficulties encountered from ignorance, forgetfulness, or unwillingness on the part of the patients.

We have arranged the histories in the following classes:—

- I. Where the patients have never had syphilis, and yet were not inoculated so far as is now known.
- II. Where the patients had syphilis before being tattooed.
- III. Where syphilis had never existed, but was communicated by the tattooing.

*CLASS I. Where the patients have never had syphilis, and yet were not inoculated, so far as is now known.*

**CASE I.**—John M., æt. 21, American, nurse, examined first September 25, and repeatedly afterwards, in the Philadelphia Hospital. He gives an unexceptionable family history. Fifteen years ago he had variola, of which the scars are very plain. He had gonorrhœa four years ago, and this year a stricture, which was successfully treated in the Philadelphia Hospital, while at the same time he was circumcised for congenital phimosis. He was tattooed by Kelly once in May and once in June. Two figures were placed on each arm, the pigments, India ink and vermillion, were mixed with Kelly's saliva. Yet since that time, save a day's inflammation of the arms, he has not had any ill effect. Careful and repeated inquiry and examination fail to discover any trace of past or present syphilis.

**CASE II.**—John E., æt. 23, Am., iron moulder, examined in Reading, October 1. He gives a good family and individual history. He was tattooed by Kelly in June. The pigments used were India ink and vermillion. The former was mixed with water, but Kelly put the needles in his mouth to suck off the India ink before putting in the vermillion.

After the operation was completed, the patient washed his arm carefully with spring water. Since that time he has had no syphilitic manifestations that he knows of, nor does our examination discover any.

CASE III.—Samuel F., a young man working in an iron foundry, examined in Reading October 1, gives a good family and personal history. He was tattooed by Kelly in June. The manner was similar to that in the other cases, in which though water was partly used to mix the pigments, the needles were often put by Kelly into his mouth. Since that time there has been no syphilitic manifestation whatever, so far as his history or our examination can discover.

CASE IV.—Joseph C., at. 37, Am., labourer, examined in the Philadelphia Hospital October 10. Five years ago had a chancré appearing about two weeks after exposure, and followed by a suppurating bubo in each groin. These burst. Afterwards he had, so far as his memory serves him, no cutaneous eruption, nor any evidence of syphilis, except a year later, an ulcer on his right temple and one on his leg. At the same time he thinks he had swelling of the glands in the left axilla. He has never had alopecia, nor iritis, nor any syphilitic development on a mucous membrane. About the end of June he was tattooed by Kelly. Two small figures were placed on the dorsum of his left forearm, and upon his chest a large crucifixion. The pigments, India ink and vermillion, were mixed with water, but Kelly put the needles in his mouth after inserting the India ink so as to suck off what was left on them before putting in the vermillion. The tattooing was followed by a very insignificant local inflammation, and not a single evidence of syphilitic inoculation. At the time of our examination, three and a half months after being tattooed, the man is in perfect general condition. He has no adenitis, no alopecia, no eruption whatever. We think there is no evidence that he has had syphilis at any time.

This last case presents some difficulty in classification, but we place it in this list because it appears to us that the lesion described as occurring five years ago was not a true chancré. The account of the period of incubation cannot be relied on after so great a lapse of time. The lesion was followed by two suppurating buboes, which opened spontaneously, and by no distinctive syphilitic manifestations whatever. The ulcers, appearing a year later, we do not think can be fairly connected with the sore on his penis.

If in this we are not mistaken, we have then four cases where, for some reason, the subjects of the tattooing have entirely escaped syphilitic inoculation. It is possible that even yet it may manifest itself, but up to this time the immunity has been perfect.

#### *CLASS II. Where the patients had syphilis before being tattooed.*

CASE V.—William W., at. 23, Am., laborer, was examined in the Philadelphia Hospital Sept. 22, and repeatedly afterwards. He gives a good family history; has been himself a steady but moderate drinker. In October, 1876, he had gonorrhœa, and in February, 1877, a phagedenic chancre, which destroyed his whole glans penis. This was followed by a papular eruption on his legs and mucous patches in his mouth, one of which was very large. While in the Philadelphia Hospital, and when these

secondary manifestations were at their height, he was tattooed by Kelly. A figure of a bracelet was placed round each wrist. The pigments, India ink, coal dust and vermillion, were mixed with Kelly's saliva. There followed only a very trifling local inflammation, and no other effect that he knows of. At the time of our examination he has papules and squamæ in his scalp, an unhealed ulcer of the stump of his penis, and a serpiginous ulcer of the fibular side of his left leg.

CASE VI.—Thomas L., æt. 27, Irish, labourer; a man stubborn, ignorant, and mendacious, was examined, by courtesy of Drs. Morton and Kirkbride, at the Pennsylvania Hospital September 25, and once later. He gives a good family history. He denies any previous venereal disease, until our physical examination detects a fine parchment-like induration on his glans penis, when he admits he has had a chancre there in May, but still denies any cutaneous manifestation.

About the end of June he was tattooed by Kelly. The figure of a crucifix was placed on the ventral aspect of his right forearm. The pigment used was coal dust, which was spit upon by Kelly and picked in with needles. There followed moderate swelling of the arm, but no axillary bubo. In about a month there appeared, on a spot of the figure representing the left nipple, a papule, which did not itch. This he scratched with a pin, and it became a pustule, which spread until it formed an indurated and elevated ulcer, having a diameter of about three-quarters of an inch. This was poulticed, and an "Indian salve" applied; some time afterward he entered the Pennsylvania Hospital, where he was treated locally with lotio nigra and constitutionally with red iodide of mercury and iodide of potassium.

At the time of our examination he has on his body a few old maculæ. There are papules in his scalp, on his forehead, body—particularly where his waistband has pressed—legs, and soles. He has a few crusted pustules on his body. In his mouth is a mucous patch. The ulcer on his arm is healing nicely. On his glans penis is the indurated scar of his old chancre. He has enlargement of his post-cervical and right supra-trochlear glands, as well as those in both groins and over both saphenous openings.

This case we cannot place in any other class than this because of the peculiar scar upon his penis, which seems to be that of a chancre antedating his tattooing, and which we take to be the starting point of his syphilis.

CASE VII.—David M., æt. 26, Am., coach painter, was examined in the Philadelphia Hospital Sept. 22, and repeatedly afterward. He gives a good family and personal history. Previous to this year he never had any venereal complaint, though for ten years he has led an irregular life. About the end of last April he contracted three sores upon his penis, which were treated with iodoform, and healed in six days.

On the sixth of May, while in the Philadelphia Hospital, and, he thinks, well, he was tattooed by Kelly. The operation consisted simply in putting in three radii of an incomplete eight-rayed star, two and a half inches in diameter, situated in the skin over the head of the right humerus. The pigment used was India ink, which was mixed with Kelly's saliva. Following this, there was considerable swelling of his arm, which passed off in a few days without treatment. In about two weeks, however, there were developed three papules, one on each of the newly made radii, which did not itch, but passed on to pustulation, broke, extended, and coalesced. To this sore he applied a salve of beeswax and lard. A bubo soon formed

in his axilla, which subsequently subsided without suppurating. He next noticed that, after a short period of fever, a series of papules appeared between his scapulae. This he thinks was within a week of the appearance of the sores on his shoulder. The papules passed on to pustulation, and then he observed the development of squamæ and papulae in his scalp. Then came enlargement of the post-cervical lymphatic glands, and three papulae on his penis, with some on his scrotum.

At the time of our examination he has upon his right shoulder, covering the lower half of the star mentioned, a portion of skin of irregular outline, about two inches in diameter, elevated one-eighth of an inch above the general surface, indurated, of a coppery-red colour, and having near its centre an ulceration still more elevated and about half an inch in diameter. In his scalp are maculæ, squamæ, and papulae, the same on his forehead, with a few papulæ and pustulæ distributed over his body. Upon his penis are a number of papules within and without his prepuce, which is long and indurated. He has sore throat, a fissure of the right angle of the mouth, post-cervical adenitis and osteoscopic pains.

This case may, perhaps, be one where the tattooing was the origin of syphilis, but the appearance of the lesion on the shoulder and the almost immediate appearance of the papular eruption between the scapulae make us hesitate to come to such a conclusion. For this reason we prefer to place it in this class, as though the sore which existed on his penis when he was tattooed had been indeed a chancre.

**CLASS III.** *Where syphilis had never existed, but was communicated by the tattooing.*

**CASE VIII.**—George F. B., æt. 17, Am., ice carrier; examined in Reading, October 1, gives a good family history, and has had a healthy life, excepting a fever when five years old, and gonorrhœa and gonorrhœal rheumatism four months ago; both of which were cured before he was tattooed. His habits have been free and easy.

About the middle of June, being quite well, he was tattooed on the right forearm by Kelly. The figure chosen was a shield, with three dark and two light bars. The pigments were India ink and vermillion. The needles were constantly in Kelly's mouth. A slight local inflammation followed, with reddening of the lymphatics up to his elbow, and glandular involvement. By an application of glycerine and cold water the arm healed, leaving, however, two weeks later five small elevations like mosquito bites, upon which were crusts. These papules itched, were scratched, and passed into pustules. They were treated some time later with a salve of red oxide of mercury and dry application of calomel, under which they healed. Five weeks after these sores the supra-trochlear gland became enlarged. About three weeks later, ten after the tattooing, he noticed squamæ in his scalp, then a mucous patch came in his mouth, and a condylomatous patch between his buttocks. He has for five weeks been under good specific treatment.

At the time of our examination he has a very few crusted papules in his scalp; a few scattered maculæ over his chest and abdomen; slight post-cervical and inguinal adenitis; some inflammation of the fauces, and, on the left of his anus, a small slightly elevated condylomatous patch, about a third of an inch in diameter.

CASE IX.—John N., at. 18, Am., brushmaker; examined in Reading, October 1; gives a good family and personal history; has led a free and easy, but not a hard, life.

About the end of May, being quite well, he was tattooed by Kelly on the flexor aspect of his right forearm. The figure was a dancing girl on an eagle, holding a flag in her hand; the pigments, India ink and vermillion, mixed with Kelly's saliva. There followed slight local inflammation, accompanied by a red streak up the arm. After an interval of five weeks there appeared at the lower inner corner of the flag a papule, elevated, indurated, with an areola and itching. It was scratched and formed a pustule, which persisted two months. Meanwhile it was once cauterized with an acid, and simple soap applied. Four weeks later, nine after the tattooing, there appeared a papular syphilitic derm, most marked on his scalp and scrotum.

At the time of our examination we find his thighs a little marbled, papules on his hands and feet, on his right buttock two medium sized condylomata. The glands in his right groin are enlarged, and he has a beautiful post-auricular adenitis.

CASE X.—Cyrus S., at. 26, Am., boatman; examined in Reading October 2; gives a perfectly good family and personal history; is an occasional but not a hard drinker, and stands now a large magnificently developed man, weighing  $195\frac{1}{2}$  lbs.

In June, being quite well, he was tattooed by Kelly on the back of the right hand. The figure was a ten rayed star; the pigments India ink and vermillion, mixed with Kelly's saliva. There followed a great deal of local inflammation and an axillary bubo. He did nothing for this condition, and in about a week, during its continuance, there appeared in the red colour a lump which, he says, was "like a pill" under his skin. This was painful, had an areola, itched, and was, as stated, indurated. It was scratched, became covered with a crust, by repeated removal of which it grew larger. In two weeks more, after a period of marked malaise and fever, there appeared a papular eruption in his scalp, on his forehead and face, in his nose, between his nates, on his penis, scrotum, palms and soles. Between his nates the papules developed into condylomata with "terrible" itching. In his mouth mucous patches also appeared. There were some pustules among the papules on his hands, feet, and penis. He has been of late under good treatment.

At the time of our examination, we find in his scalp and on his forehead and face traces of maculae and papules. His chest, abdomen, back, thighs, and legs are beautifully clean. Between his nates are traces of the former condylomata and a few papules. On the soles of his feet are scars of many old papules. His fauces are erythematous. On his upper lip, left side, is a small mucous patch. He has slight enlargement of the submaxillary lymphatic glands, post-cervical adenitis most noticeable on the right side, and marked alopecia.

CASE XI.—Jacob H., at. 18, Am., examined in the Philadelphia Hospital October 15, is a young man of good appearance, with a good family and personal history. He says he has never had sexual intercourse.

About the beginning of June, being in perfect health, he was tattooed in Reading by Kelly. The figure of an eagle with a scroll in its beak, surmounted by a crown and two letters, was placed on the flexor aspect of his right forearm. The pigments, India ink and vermillion, were mixed with Kelly's saliva alone. There followed scarcely any local inflammation. In

about seven weeks there appeared on the right wing of the eagle two papules, which he compares to mosquito bites, developing into pustules, and soon followed by one on the crown and two on the scroll. There came in a short time a red streak extending up toward the axilla, and an axillary bubo. The pustules he burnt with nitrate of silver, and got some medicine from a doctor. Five weeks after the appearance of the papules there appeared a papule on his penis, then two on his scrotum, a few about his anus, a few on his head, and three on his left hand, with soreness of his gums and throat. About six weeks ago, when in the condition just described, he was treated locally and constitutionally with good results.

At the time of our examination he has two or three nearly cured papules in his scalp, and as many in his left palm. His fauces are deeply inflamed and swollen; his gums inflamed and ulcerated; he has alopecia and enlargement of the inguinal glands on both sides.

CASE XII.—Edward W., aet. 20, Am., wool-washer; examined, by courtesy of Prof. Wm. H. Pancoast, in the Philadelphia Hospital Sept. 21, and repeatedly afterwards; gives an unexceptionable family history, and has always been healthy until last spring, when he had an attack of typhoid fever, which was treated in this hospital. He has been of steady, temperate habits, and never had any venereal disease.

About the end of June he was tattooed by Kelly, upon the flexor aspect of the left forearm. The figure was a goddess of liberty seated upon an eagle, and bearing an American flag; the pigments were India ink and vermillion, *mixed with pure water*. The operation was followed by a moderate and transient degree of local inflammation without any involvement of the lymphatics. Two weeks before this he had been tattooed by the same man on the flexor aspect of the right arm with the figure of a crucifixion. On the radial side of the figure and in the background were two oriental looking buildings, and on the ulnar side a small tree. The pigments, coal-dust and vermillion, were *mixed with Kelly's saliva*. The arm soon became extremely inflamed and swollen. This inflammation, however, subsided in four or five days, and he observed no involvement of the lymphatic vessels or glands.

In about a month there appeared on the ulnar side of the base of the figure, a papule, which he compares to a mosquito bite. It itched much, was scratched, became purulent, and enlarged until there was a circumscribed ulceration three-quarters of an inch in diameter, with a flat, somewhat elevated, indurated base, and a well-defined areola. This process the patient watched carefully and describes accurately. At the time of the development of the papule the glands of the right axilla became enlarged. Six weeks later, about ten after the tattooing, a macular syphiloderm developed upon his forehead, chest, belly, and legs, in this order, followed by a mixed squamous and papular syphiloderm.

At the time of our examination the patient appears in excellent general condition. He is a stout, well developed, healthy looking young man. The ulcer described still persists on his right arm. On his forehead is a light, brownish syphiloderm. There are papules in his scalp, a few on his arms and back, very many on his palms and soles, and about his anus many passing into condylomata. His scrotum is so thickly covered with flat papules that it is hard to discover any interspaces. There are very many on his penis. Within the prepuce these are excoriated and closely simulate chancres in a similar stage. On his thighs are some pustules as well as papules. He has also distinct right-sided post-cervical adenitis.

**CASE XIII.**—Joseph P., at. 20, Am., iron moulder; examined in Reading October 1. His family history is perfectly good. About a year ago he had inflammatory rheumatism, lasting ten weeks. He has never had any venereal disease. His habits have been regular and steady.

In June, being perfectly well, he was tattooed on the flexor aspect of the right forearm, by Kelly. The figure was a 2, upon which lies a ladder. The pigments were India ink mixed with water, and vermillion mixed with Kelly's saliva. There followed slight local but no glandular inflammation. This received no treatment. In about three weeks appeared a papule, elevated, indurated, and itching. This was scratched and developed into a pustule, which enlarged to about a half inch in diameter. It was treated with lead-water and laudanum, then later with lotio nigra and calomel, while he took some internal medicine.

Ten days after the appearance of the papule, without preceding fever, the lymphatics of his arm became red and his axilla tender. Then appeared a macular and squamous syphilitic, followed by papules around the corona glandis penis, and along the raphe, with a mucous patch in his mouth, swelling of the papillæ of the tongue, and sore-throat.

At the time of our examination the patient complains of indisposition, with pains in his back and stomach. Old maculae are distributed over his scalp and legs; on his back, penis, and scrotum are a few papules, and many in his palms and soles. On the inside of the right cheek is a small mucous patch. His submaxillary, postcervical, and inguinal glands are enlarged, and he has some alopecia and sore-throat.

**CASE XIV.**—Charles P., at. 19, Am., japanner; was examined in Reading October 1. His family history is good. Four years ago he had typhoid fever; three months ago—since being tattooed—he had gonorrhœa. He says his habits have been regular, and he is not addicted to excessive venery.

About the middle of June, when in perfect health, he was tattooed on the flexor aspect of the right forearm, by Kelly. The figure is very large and thickly coloured. It represents a naked woman kneeling on a pedestal, under a dense weeping willow tree. The pigments, India ink and vermillion, were mixed with Kelly's saliva. For a week the arm was very sore, and a gland in the axilla swelled, but soon subsided. To the arm cold water was applied. In about two weeks appeared on the figure a single papule, which had a distinct areola, was indurated, elevated, and itched; yet was not scratched. It developed into a pustule, ruptured, became encrusted, and healed in two weeks without treatment. About two weeks later appeared, below the figure, a flat papule, accompanied by an axillary bubo. At the same time came a general macular syphilitic, which desquamated and was succeeded by papules, which were profuse on his penis—he thinks there were seventy-five! He also had condylomata between his toes. At the time of our examination—three and a half months after his tattooing—he has maculae and squamae on his scalp, and a well-marked corona veneris. There are papules on his chest, back, arms, legs (arranged in circles in the popliteal spaces), penis, scrotum, and soles. In his nose are crusted papules, on the right side of his uvula is an ulcer. The corresponding submaxillary gland is enlarged. He has also bilateral inguinal adenitis and well-marked alopecia and sore-throat.

**CASE XV.**—Thos. G., at. 23, Irish, iron puddler; examined in the Philadelphia Hospital September 21, gives an unexceptionable family history; has had no serious illness before, nor any venereal complaint; has been a steady, but not a hard drinker.

About the middle of June—at a time when he was under treatment in the Philadelphia Hospital for traumatic orchitis, but otherwise well—he was tattooed by Kelly on the flexor aspect of the left forearm. The figure was that of a cross upon which was a wreath and a heart. The pigments, coal-dust and vermillion, were *mixed with fresh water*. Following the operation there was some soreness of the arm, lasting two days, and enlargement of the axillary lymphatic glands. Both these subsided readily.

Three days previous to this tattooing Kelly had put on the flexor aspect of his right forearm the figure of a crucifix, with a background of two oriental looking buildings on the radial side, and on the ulnar a small tree. This time the same pigments were *moistened with Kelly's saliva*. The arm became much inflamed, and the next day a gland above the internal condyle of the humerus and one in the axilla were enlarged; of these the former subsided soon. The local soreness lasted three days, but required no treatment. About five weeks later, at a point upon the trunk of the tree alluded to, appeared two papules—which he compares to mosquito-bites. These developed into pustules, with indurated bases, burst and coalesced, leaving an elevated suppurating surface, about three-fourths of an inch in diameter, with a distinct areola, which he treated, himself, with cosmoline and iodiform. About this time the bubo in the axilla suppurred and discharged spontaneously. About ten weeks after the tattooing, and five or six after the appearance of the sore just described, he had a short period of feverishness and indisposition, and then appeared a papular syphilitic, accompanied or followed by a fissure of the right angle of the mouth.

At the time of our examination he has papules on his scalp, back, arms, penis, scrotum, nates, legs, palms, and soles, as well as between his toes. The number on his palms is very remarkable. On the cutaneous surface of his prepuce are papules, closely resembling hard chancre, while on the mucous surface are ulcerations simulating chancreoids. The fissure of the right angle of the mouth persists. He is suffering from a balanitis and gonorrhœa contracted recently. He has post-cervical adenitis, and is in a very much poorer general physical condition than he ever was before the tattooing was done.

CASE XVI.—Frederick R., age 21, Am., brickmaker; examined in the Philadelphia Hospital September 25; gives a good family history; has been of tolerably steady habits; many years ago had an inguinal bubo, from over-walking; four years ago had gonorrhœa, from which he inoculated his left eye with gonorrhœal ophthalmia, resulting in its almost total destruction. About the end of May he was tattooed by Kelly. On the dorsal aspect of the left forearm was placed a dancing girl, and near it a cross, heart, and anchor. On the inner side of the upper arm was placed a goddess of liberty on an eagle. The pigments, India ink and vermillion, were mixed with Kelly's saliva. The day following his arm was much inflamed, and a bubo formed in the axilla. Both the inflammation and the bubo passed away in a few days. A gland *below* the inner condyle of the humerus now became enlarged and painful, and then subsided. Four weeks from the date of tattooing there appeared two swellings, one above the right knee and one on the left foot of the figure of the dancing girl. These he compares to a boil, with pus at the apex. They itched, were scratched, and crusts formed upon them. Later, appeared a fissure of the left angle of his mouth, and papules on his tongue, penis, and scrotum, and about his anus, as well as one or two on his left palm and one on his

right foot. At our examination we find on his body traces of a macular syphiloderm; about his anus are three patches of ulcerating hypertrophic papules; two similar patches on the left and one on the right side of his scrotum; traces of two healed patches also on his scrotum; one such patch in each thigh; and one on the right calf; his pharynx and fauces are inflamed; his tongue swollen and fissured; a mucous patch inside the left angle of his mouth and one inside the lower lip. His eyes are inflamed, and seem to threaten iritis. He has post-cervical adenitis.

CASE XVII.—Daniel H., at. 21, Am., labourer; examined in the Philadelphia Hospital September 26; gives a family history of phthisis, himself has always been healthy and of steady habits, though an occasional drinker; has never had any venereal disease. A year ago he was tattooed on the right forearm. No evil results followed.

In the latter part of May of this year he was tattooed by Kelly on the dorsal aspect of the right forearm. The figure was a goddess of liberty upon an eagle; the pigments, India ink and vermillion, mixed with Kelly's saliva. He was at the same time tattooed in the same way, on the left arm, with the figure of a little girl holding a bouquet in her left hand. Both these figures were followed by great local pain and swelling, and involvement of the axillary glands. The latter, however, subsided in a few days. In about three weeks there appeared on the figure on his right arm, and later on the other, a number of papules, which multiplied until on the former there were seventeen and on the latter twenty-four. In the latter case the papules appeared wherever the vermillion had been used. The first appearance of these papules the patient compares to mosquito bites. They were indurated and elevated, and had an areola; they itched, were scratched, became purulent, and formed crusts. A number of them were cauterized by a physician, an ointment applied, and they healed up in about a fortnight. The rest healed spontaneously. No axillary bubo followed. About the middle of July, about six weeks after the tattooing and three after the first syphilitic manifestation, a papular eruption appeared on his scalp, penis, scrotum, palms, and soles, and in his nasal cavity and external auditory canals. Later, on his forehead and lips was developed syphilitic impetigo. In three months from the time of tattooing mucous patches appeared in his mouth. Since the early cauterization he has been treated with "roots" by a snake doctor. At our examination we find many desquamating papules in his scalp, a few large papules on his abdomen, three smaller ones around his corona glandis penis, one on the frenum, four on the scrotum, nine on his thighs, one in the left popliteal space, and the traces of very many on his palms and soles. On his forehead are four beautiful crescentic patches of impetiginous pustules, and on his lips several more. His lips and mouth are covered with mucous patches, and about his anus he has *immense* condylomata.

CASE XVIII.—John G., at. 16, Am., machinist; examined in the Philadelphia Hospital September 29; his family and personal history is excellent. About the end of May, when in perfect health, he was tattooed in Reading by Kelly, on the flexor aspect of his right forearm. The figure was that of a dancing girl; the pigments, India ink, mixed with water, and vermillion, mixed with Kelly's saliva. After pricking in the colors, Kelly spit on the patient's arm and rubbed it well. Slight and transient local inflammation followed, for which cold water was applied, but there was no glandular swelling. In four weeks there appeared on the left shoulder of the figure a papule, indurated, itching, and having an areola,

followed, the next week, by six similar ones, scattered over the figure. They all developed into pustules under the influence of scratching. He now received treatment, which he describes as a salve and powders. Two weeks later, six after the tattooing, without preceding fever, a number of small lymphatic glands below the elbow-joint enlarged, and a lymphatic vessel, running from them to the axilla, became hard, like a whip-cord. These conditions persist at this time. He next noticed a papular eruption on the soles of his feet, with a few papules on his back and neck, the latter developing into pustules. He now treated himself with gin and mandrake roots. At the time of our examination, a little more than four months after his tattooing, we find his scalp clean, patches of copper-coloured spots on his forehead, papules in his nasal cavity and right external auditory meatus, on his face, a few on his chest, several hypertrophic and encrusted on his abdomen, one in his right axilla, quite a number of medium size on his back and buttocks, many on his arms, penis, scrotum, thighs, shins, and both soles. There are a few pustules on his back. Between his mates are three condylomatous patches, and others between the toes of both feet. He has slight erythema of the fauces and a large mucous patch on the roof of his mouth. He has not very well-marked post-cervical adenitis.

CASE XIX.—Alvin S., at. 20, Am., teamster; examined in the Philadelphia Hospital September 29; gives a perfectly good family and personal history, except that he had, in 1875, a gonorrhœa lasting seven months, and in 1876 another attack which was cured in two weeks; his habits have been pretty steady, though occasionally indulging in venery.

About the end of May, 1877, being perfectly well, he was tattooed by Kelly on the flexor aspect of his left forearm; the figure was that of a dancing girl; the pigments India ink mixed with water, and vermillion mixed with Kelly's saliva. There followed a slight local inflammation lasting but two days, and presenting no involvement of the lymphatics, which he did not think demanded any treatment. Two weeks from the tattooing there appeared on the breast of the figure three papules, then two more on the left lower part of her scanty dress, and a week later on the crossed ankles another. These were hard, elevated, and red; spread into flat papules, desquamating somewhat, and finally secreted a little pus. Soon after their appearance they were cauterized, and the patient constitutionally treated by a regular practitioner. In about two weeks, without any preceding fever, there appeared upon his legs below the knees, a squamous syphilitoderm, followed by many papules and pustules on his thighs, scrotum, and penis. Of the latter some were excoriated. About the same time he noticed an enlargement of the left supra-trochlear gland. For this stage of the disease also, he was treated constitutionally.

At the time of our examination he had a gonorrhœa two weeks old; in his scalp are many maculae, and a few on his chest and shins; there are a few papules on the side of his nose, and some encrusted ones in its cavity, many on his thighs, and a number on both soles. There are a few pustules on his back—perhaps acne. Between his mates are two condylomatous patches, and others between the third and fourth, and fourth and fifth toes of the right foot. He has erythema of the fauces, an ulcer on the right side of the uvula, mucous patches on the edge and lower surface of his tongue, very large ones inside the angles of his mouth, and smaller ones within both lips. One seems to be developing on the roof of his mouth. He has marked submaxillary adenitis, alopecia, and left iritis.

CASE XX.—James F. P., at. 25, American, iron moulder; examined in Reading October 1; gives a good family and personal history, except

that two years ago he had an attack of gonorrhœa which lasted four months. His habits have been pretty good, and he never drinks. Years ago he had a suppurating bubo in the left groin from an ingrowing nail. He was tattooed by Kelly about the middle of June, being then perfectly well. A female bust was placed upon the flexor aspect of his right forearm, and above it two crossed branches. The pigments, India ink and vermillion, were mixed with water and Kelly's saliva, the needles being frequently put in his mouth. There was slight and transient local inflammation, and no glandular involvement. He applied cold water to his arm. In four weeks there appeared upon the tattooed figure, many small papules, which were not sore nor purulent, *nor have they ever been abraded or excoriated*, though now having a tendency to scale a little. They received no treatment. In about six weeks from the date of tattooing, there appeared on his forehead and penis a papular eruption, then later mucous patches on the tip of his tongue and the sides of his gums. For these he had no treatment.

At the time of our examination we find a few papules on his body, and between his nates, two on his corona glandis penis, crescentic patches in his popliteal spaces, a few on his knees, shins, and ankles, his palms and soles crowded with them. In his mouth are a number of mucous patches. He has post-cervical, submaxillary and inguinal adenitis, with marked enlargement of his right supra-trochlear gland, and one behind his left ear. He has also alopecia and osteoscopic pains.

CASE XXI.—George H., æt. 23, American laborer; examined in Reading October 2; gives a good family and personal history; has been of somewhat irregular habits, but not a hard drinker. About the end of May, being quite well, he was tattooed by Kelly on the left forearm. The figure was a goddess of liberty with a flag, and two crossed branches below; the pigments were India ink mixed with water, and vermillion mixed with Kelly's saliva. Kelly also spit on the arm and rubbed the colours in. There was considerable local inflammation, but it was treated simply with soap and water. In about two weeks there appeared a papule in the middle of the crossed branches, and in two days three more near by. They developed into pustules and formed deep ulcers which were treated and healed in three weeks. The scars persist, and are about half an inch in diameter. A month after these papules he had a period of fever with marked malaise, followed by a general erythematous eruption, then maculae and squamae on his chest and shins, followed by papules on his head and forehead, in his nose, on his arms, legs, palms, and soles, and between his toes. Later he had mucous patches in his mouth and condylomata about his anus.

At the time of our examination we find a few maculae on his chest. There are traces of very many small papules on his forehead. Papules in various stages of development or recession are distributed over his back, abdomen, thighs, popliteal spaces, shins, ankles, palms, and soles. On his left arm is a fine crust from a vaccination done twelve days ago. On the tattooed figure of liberty are scars of the four pustules named above. His fauces are red and ulcerated; on the roof of his mouth are large mucous patches, and others on his gums. His tongue is swollen, ridged, and furrowed, and has on its left edge a mucous patch. The supra-trochlear glands in both arms are enlarged. His general condition is bad; he is sleepless and miserable, suffering much with osteoscopic pains.

CASE XXII.—William L., æt. 21, Am., butcher; examined at the House of Correction Oct. 25; gives a good family and personal history;

is of healthy general appearance. His statements are clear and positive. In September of last year, on the occasion of his twentieth birthday, he drank, and had intercourse with a prostitute. Ten or fifteen days later, without any other exposure, he noticed, on the left side of his glans penis, a sore, which a friend told him was a "chancre." This soon became an ulcer, and he got some nitrate of silver and cauterized it. He took no other measures in this connection. The crusts which formed upon the ulcer adhered to his shirt, and were a number of times pulled off. Once, when the sore was a week or two old, he had intercourse with a woman, and the crust came off and remained in her vagina. In a few weeks the ulcer healed. Upon careful and exhaustive inquiry he states that he had no subsequent lymphatic or cutaneous evidence of syphilis. However, he suffered all the following winter with tonsillar enlargement, which he believed to be mumps, and which was much relieved by a gargle of vinegar and cayenne pepper. In February of this year—five months after the sore on his penis—there appeared on the outer aspect of his right thigh, about nine inches below the position of the trochanter major, a sort of a blister, which spread to a diameter of about an inch and became encrusted. Some weeks later a similar but smaller ulcer formed six inches higher on his thigh. After trying in vain to heal it by poulticing he went, on April 27, to the Philadelphia Hospital, where he was admitted to the venereal ward. Here the sores were diagnosed as syphilitic rupia; the crusts, which are described by the interne, Dr. Oliver, as like a tortoise-shell and of a dirty blackish-brown colour, came off; local cauterization with nitric acid was used, and the protiodide of mercury administered internally. In about a month the ulcers were healed.

About the end of June, while acting as an assistant in the hospital, he was tattooed by Kelly on the flexor aspect of the left forearm. The figure was a crucifixion, the pigments India ink and vermillion, both of which were moistened solely with the tattooer's saliva. There followed slight and transient local inflammation, requiring no special treatment. In ten days he noticed three sores upon the tattooed figure, one on the right hand, one on the left shoulder, and one on the left wrist. These, he says, were like the bite of a "mosquito or bedbug." They itched, but were not scratched for fear of "poisoning" them. They soon secreted pus, and became ulcerated. In about a week an axillary bubo formed. He now became alarmed, and consulted Dr. Oliver, who describes the sores as small papules, situated on a plainly indurated base, with an areola which faded out toward the circumference. They soon developed into pustules, and later into excavated ulcers, which were cauterized with nitric acid, after which they became encrusted. At the time of cauterization he was placed upon anti-syphilitic treatment. He now permitted Kelly to tattoo both his upper arms, but made him mix his pigments with water. No evil results followed these operations. He noticed no evidences of secondary syphilis until two months later, when there appeared papules in his nose and mucous patches in his mouth.

At the time of our examination, four months after the tattooing, we find on his left forearm three hypertrophic papules covered with thick adherent scales, and surrounded by areas of thin bluish skin. These are the remains of the primary lesions described above, and are the exact counterpart of what we found on many of the other patients of this class. On his body are remains of a beautiful macular syphiloderm, of which he says he was not aware when it came. There are some papules in his nose, and many

in his palms and soles. He says there have been none on his genitals. He has mucous patches in his mouth; an extensive one over the ascending ramus of the right maxilla inferior; one on the right side of the lower lip; and a number of small ones on the roof of his mouth. The only adenitis we can find is a trifling enlargement of both supra-trochlear glands; perhaps a slight enlargement of the right inguinal glands, and in his left axilla remains of the bubo. He has marked alopecia, and complains of severe muscular pains as well as of pains in his bones. On the left side of his glans penis is a small teat-like scar, which when pinched gives a feeling of slight induration. Upon his right thigh are the scars of the sores which he connects with his chancre acquired in September 1876. The lower or earlier one presents a thin-skinned, elevated, slightly indurated, ham-coloured surface, oval in shape, about three-quarters of an inch in its longer, and half an inch in its shorter diameter, having extending to a distance of half an inch from its margin, all round, an areola of thin dusky skin. The upper or later lesion is similar in character, but smaller. The inner elevated and indurated part is less than a centimetre, and the total, including areola, about half an inch in diameter.

There is some difficulty in assigning this case its proper place; but we conclude it is one where syphilis was communicated by the tattooing, in spite of the singularly clear and honest statement of the patient in regard to his previous history, and in spite of the scar on his penis, the sore-throat, and the appearance of the lesions occurring after what he himself believed an infecting or true chancre, and which he believed to be syphilis. This conclusion depends upon the patient's positive and distinct statement that these two, the sore-throat and the ulcers on his thigh, were the only things simulating secondary syphilis which he observed. He had after his chancre no bubo, no eruption, no crusts in his head, no alopecia, no iritis. When to this we add the history and appearance of the lesion which followed his tattooing, and the condition in which he is at the time of our examination, we are brought to the conclusion, partly stated above, that his lesion last September was a chaneroid—not a chancre—that his sore-throat was probably a tonsillitis, and that the ulcers in his leg were probably ecthyma, and not rupia, as at first sight they might appear. Consequently we include the case among those in which syphilis was for the first time communicated by the tattooing.

*Resumé.*—These fifteen cases of Class III. present a number of points of great interest which we will examine, so far as possible, in their natural order.

The first of these points is in regard to the method of inoculation. In every case we find that the needles used for tattooing were repeatedly inserted in Kelly's mouth; saliva was used to moisten at least one of the pigments. Can we then say the saliva was the contagion? No; for we find equally that all the cases in Class I., who never had syphilis, and present as yet no evidence of it since their tattooing, were exposed to apparently as great risk of infection; and must conclude that we have not

here any ground to doubt the general belief that *the unmixed salivary secretion cannot communicate syphilis.*

On the other hand, the existence and the special location of the mucous patches in Kelly's mouth seem to offer a reasonable and satisfactory explanation of the effects of his tattooing. Nothing is more probable than that, in the repeated application of the needles to his lips, the sucking, the wetting of them, they in most cases bore away virus from the lesions which were so conveniently situated for this; while, also, nothing is easier to suppose than that the immunity in some cases was due to the fortuitous absence of this virus.

A question might suggest itself as to the influence of tobacco juice mingled with the virus. From our examination of the cases here given we are led personally to the opinion that it did not have any, either in diminishing or increasing its activity.

In Cases XII. and XV. we have beautifully contrasted the innocence of tattooing with water, and the serious result when the saliva was used. We frequently observed that when one pigment was mixed with water and the other with saliva, the primary lesion had its origin unmistakably where the latter was used.

In the *immediate effects* we find considerable variety, but in none any specific evidence of a constitutional infection; this comes out first with the appearance, after a period of incubation varying from one to seven weeks, of a lesion which is of the utmost interest for us.

*What was this primary lesion?* Our inquiry (in which we particularly avoided asking leading questions) secured answers which, though varied, were unmistakable. Some compared the first manifestation to a pimple, some to a mosquito or bedbug bite, and one to "a pill under the skin;" all presenting the essential characteristics of local swelling and induration which mark a papule. In most cases this papule, like any other of its class, passed on, under accidental influences, to excoriation, ulceration, or pustulation; yet in one remarkable instance (Case XX.) there were none of these modifications, but from first to last *only and simply papules.*

In other words, these cases present a beautiful illustration of the nature and progress of a chancre, which we would define as in the beginning a papule excited by a specific irritant, undergoing modifications as varied as the circumstances in which it is placed, and followed sooner or later by other manifestations of syphilis. (This is the only sense in which the term is used by us.)

The theory of Diday, that the initial lesion of syphilis, contracted from the virus of a secondary manifestation, is an excoriated sore as contrasted with the ulcerated form when the poison was primary, does not seem supported by the facts of this series of cases; for, on the contrary, we find every variety, from the simple, unabraded papule to the deep and multiple ulcer.

*The multiplicity of the initial lesion* in some of these cases is not remarkable when we consider the means of inoculation.

*The varying terms of incubation* of the primary lesion—from one to seven weeks—as well as those of the secondary manifestations—from one to six weeks more—may or may not have been what the patients stated. We have no means of correcting their statements, and can only reproduce them with this explanation, and without attempting any generalizations founded upon them.

After the appearance of the initial lesion there was, then, a period of incubation varying, as the patients believed, from one week to six weeks, followed by—

*The manifestations of "secondary" syphilis.*—In three cases these were ushered in by fever and malaise; in one the glands just below the bend of the elbow were enlarged; in five the supra-trochlear gland (gland of Ricord). In three cases there was reddening, and in one persistent whipcord-like induration of a lymphatic vessel. In six cases the glands in the axilla were involved. It is noticeable that in one case the axillary bubo suppurated and discharged spontaneously—an example of the rare but possible occurrence of a suppurating bubo following a chancre. There were four cases in which we could not satisfy ourselves of the implication of near lymphatic glands.

Following or accompanying this stage we find the manifestation of syphilis on the cutaneous and mucous surfaces. Of the earlier and more transient forms—erythema, maculae, and squamae—we found it in some cases difficult to obtain any satisfactory evidence; in some, however, we found distinct traces, though the patients themselves had not been aware of their occurrence. But when we looked for the papular eruptions there was no such difficulty. The history was well impressed on the patients' minds, and the present evidence often only too obvious. A glance over the summary shows that these were, in most cases, of an extremely grave character. In twelve of the fifteen cases there were mucous patches or ulcers in the mouth. In one the patches were very numerous, and in two both numerous and extensive. In one case there was a fissure of the angle of the mouth. In ten cases there were condylomata, which were, in one of them, immense. In one case there was well-marked impetigo on the forehead and lips. In one there was iritis; in nine post-cervical, in two post-auricular, in six inguinal, in five submaxillary, adenitis. In seven cases there was alopecia, and in three osteoscopic pains.

A noteworthy point seems to us the frequency with which the papules were located on the penis and scrotum. This occurred in twelve cases, in seven of which the number was very great. In many the papules situated on and within the prepuce, and about the corona glandis penis, were in their physical features exactly like chancrea. (See, for example, Case VII.) In twelve cases there were papules developed in the soles, and in

ten in the palms. In seven they were developed in the nasal cavity, becoming a cause of grave annoyance. In two there were papules in the external auditory meatus.

The result of auto-inoculation, practised on two patients who had plain manifestations of syphilis, was as follows:—

**CASE XV.**—On September 19th we scraped, with a tenotome, a little secretion from the primary lesion on his right arm, and inserted it in his left upper arm by scarification. This was covered with a watch crystal, held in place by a fenestrated band of adhesive plaster.

The second day there was a slight reddening of the part scarified, and apparently a little thin serous secretion under the glass. The third day both these seemed greater. The fourth day the epidermis was elevated and macerated, and a superficial ulceration, about a sixth of an inch in diameter, beginning. Over this was the grayish-white coating of epidermis; around it was a narrow areola. It was moist, and gave material pain. The fifth day the areola was less; the ulcer about the same. The sixth day there was scarcely any areola; but the ulcer was deeper. The seventh day the areola was apparently unchanged; but the ulcer acquiring an irregular edge, and having a thin deposit covering it. The eighth day the ulcer was reduced in size, and the areola had disappeared. The ninth day no observation was made. The tenth day the ulcer was almost healed; but the patient complained of much pain. So the glass was removed, and we found its upper and lower edge had cut into the skin, making with the irritation of the secretions of the ulcer, two others, linear and ugly, each about three-quarters of an inch long, and just like their predecessor in character.

As we did not think the study of these would add any material point to that of the one we had made designedly, we applied to them, and the trace of it that was left, lotio nigra, under which all healed up nicely in three or four days more.

**CASE XII.**—On September 25th we scraped off, with a tenotome, a little of the secretion of the primary lesion on his right arm, and attempted to insert it in the left forearm by a simple puncture, in which we turned the point once around. In covering the spot with a watch glass we avoided the danger of producing such trouble as we had in the other case, by inclosing the glass between two fenestrated strips of plaster, placed face to face, of which the outer or upper was longer than the inner, and tailed—the tails serving to fix the whole, and keep it in position.

The patient was under observation for about two weeks longer, at the end of which time he eloped from the hospital. So far the result was entirely negative, save perhaps an insignificant reddening of the point of puncture the day after it was made.

In reviewing these two cases, we find, in the former the virus from a primary syphilitic lesion—a chancre—producing by auto-inoculation an ulcer presenting the features of a so-called chancreoid.

Upon the apparently negative result in the second case we do not think anything can be predicated, for the time of observation was too limited; and, besides, we have no right to assume that the inoculation was successfully executed.

The theoretical conclusions of our investigation are, we think, indisputably confirmatory of the view that *the virus from secondary syphilitic manifestations is in a high degree inoculable, that the primary lesion following such inoculation is a true chancre, and that with this begins constitutional syphilis, differing in no essential point from that contracted from a primary syphilitic lesion.*

The practical conclusions are inseparable from the theoretical, viz., that too great caution cannot be used lest by any means the virus of inoculable lesions be transferred to innocent persons. The hands of the surgeon, his instruments, bandages, or other appliances should be most scrupulously cleaned after use about syphilitic patients. Dentists may especially take to heart this lesson, which is the more deeply impressed upon our minds, because, at this time, we are investigating a case where an unsuspecting woman was inoculated with syphilis of a most malignant type, while under a dentist's hands.

Tattooing, we think, might well be forbidden in the army and navy, as a useless and perhaps pernicious practice, one which may injure the men and prove an expense to the government, by bringing into hospitals and on the pension lists some who might otherwise be in active service.

We think, too, that no false sentiment should prevent the distribution of such warning to the community as shall acquaint them with the sources of danger alluded to, as well as the possibility of syphilitic inoculation in the acts of kissing, nursing, using in common table utensils, towels, or anything which may come into contact with a syphilitic lesion.





